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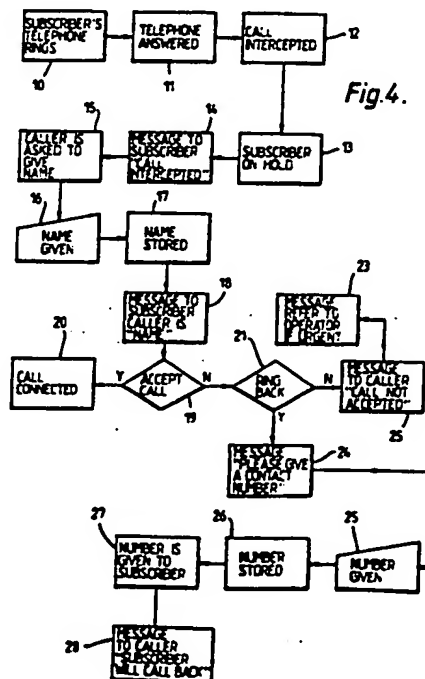
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(54) **Telephone call intercept system**

(57) An automatic call interception apparatus (1) provides a barrier between the subscriber and the caller. The apparatus can ask the callers identity, without the subscriber having to speak to the caller personally. The reply is recorded and then played back to the subscriber who can then decide whether or not to accept the call. The call need be intercepted only if the subscriber answers thus minimising inconvenience to the caller.



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Fig.1a.

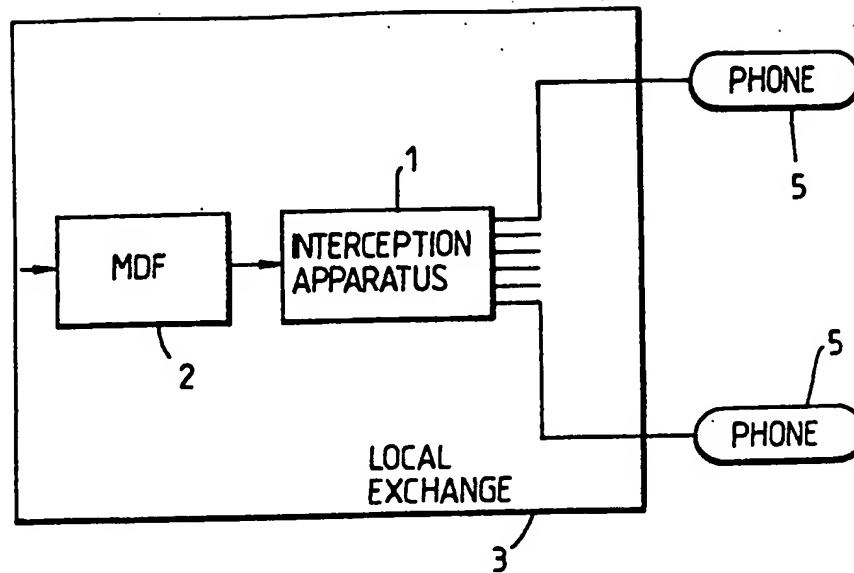


Fig.1b.

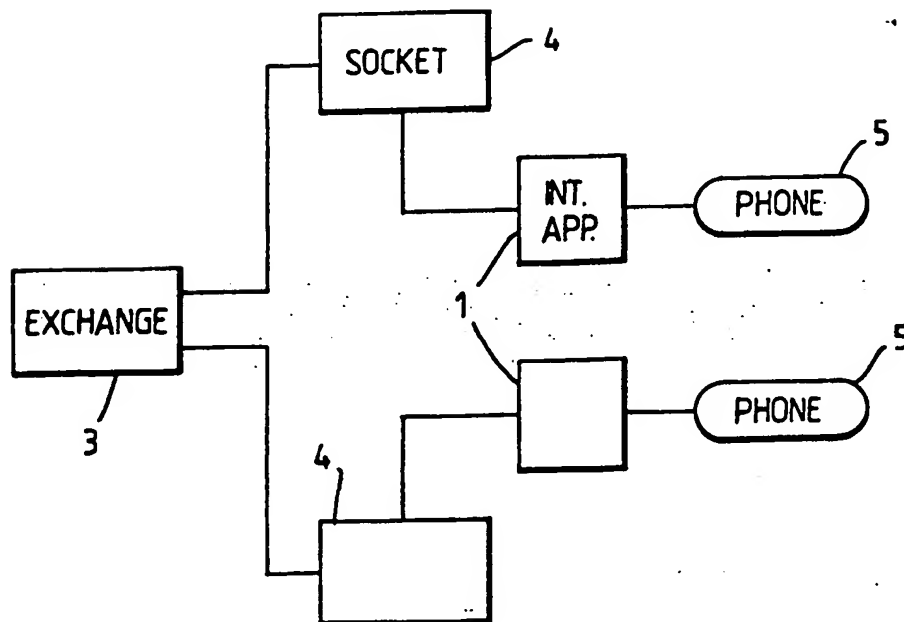


Fig. 2.

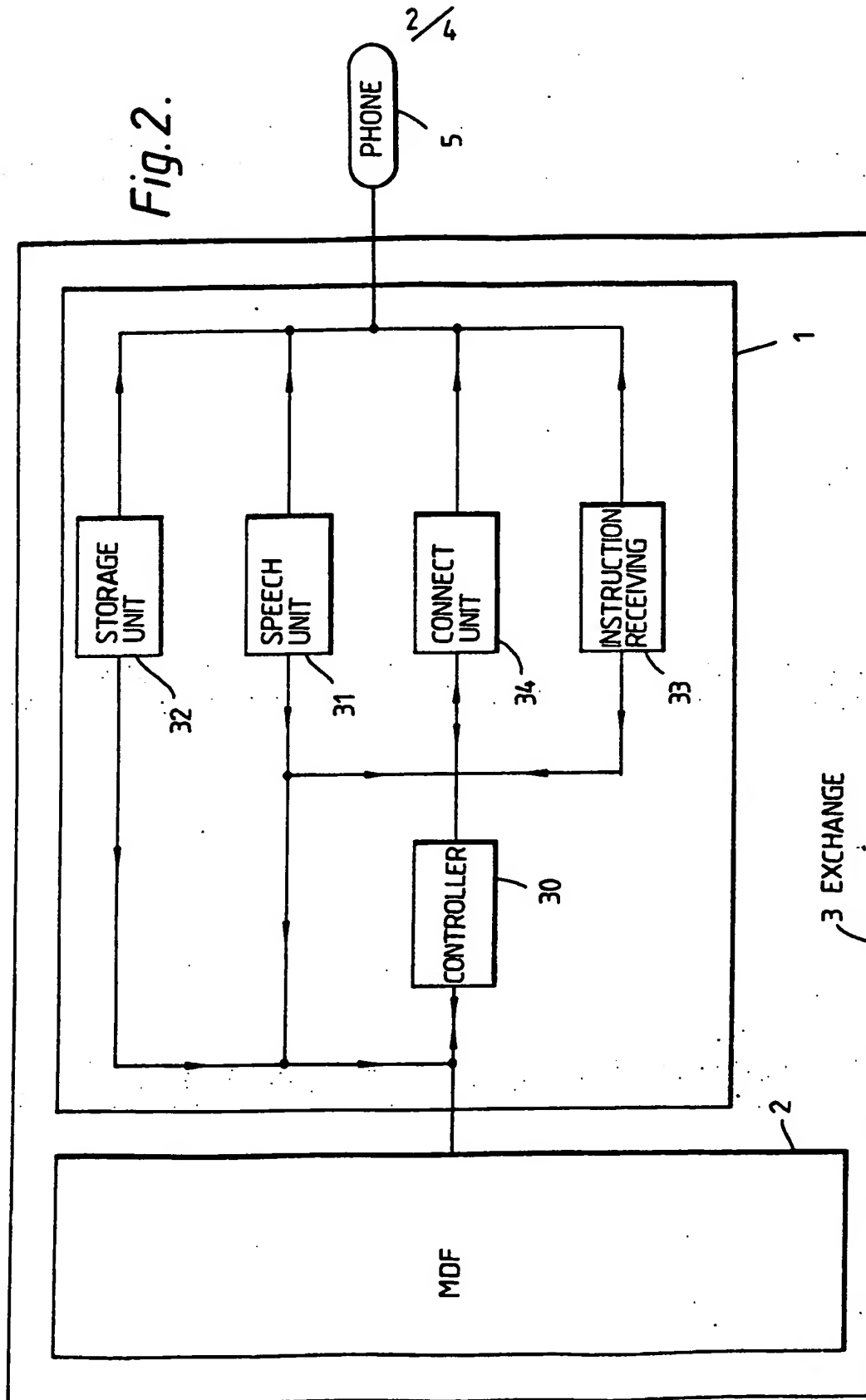
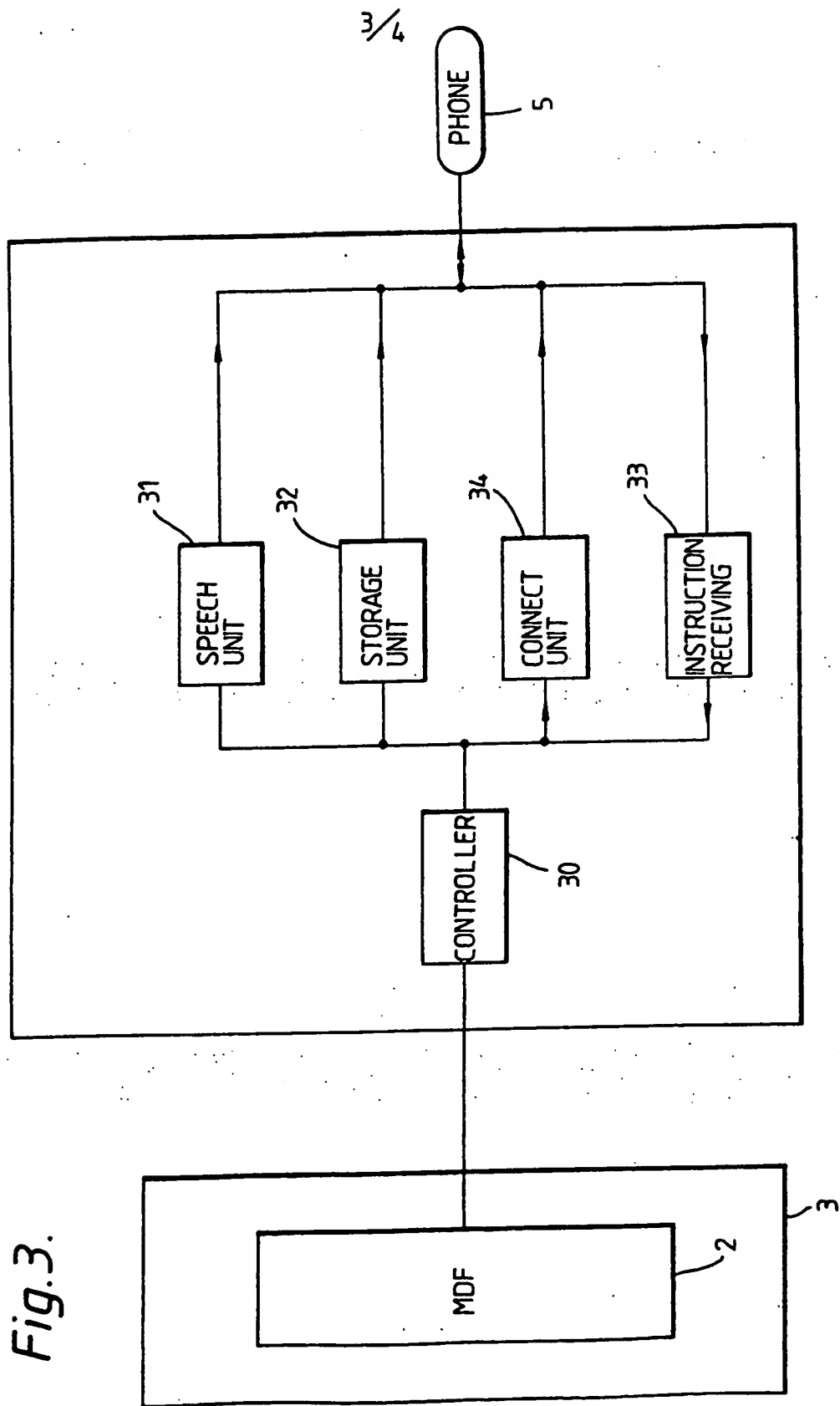
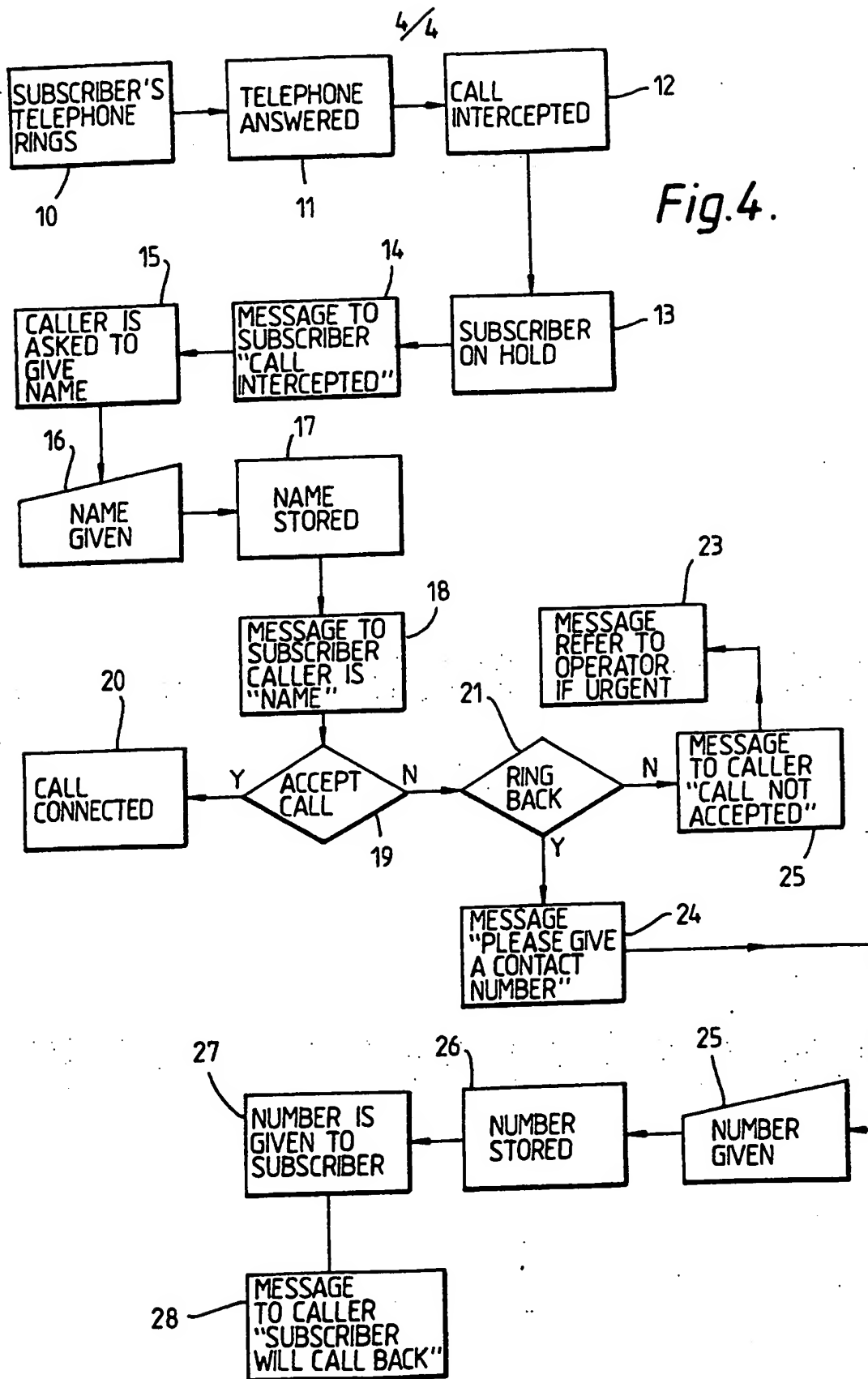


Fig.3.





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TELEPHONE CALL INTERCEPT SYSTEM

5 This invention relates to an automatic telephone call interception facility to allow screening of incoming calls. The invention has a particular use as a deterrent to malicious callers.

Subscribers are often bothered with unwelcome calls which may be malicious or just time consuming, eg from salespeople.

10 A call intercept facility is available to subscribers troubled by malicious callers. However, this facility has several disadvantages.

This facility involves all the subscriber's calls being diverted to an operator. The operator then asks:

1. the identity of the calling party,
- 15 2. the telephone number to which the calling party wishes to be connected,
3. the telephone number of the calling party,
4. who the calling party wishes to speak to.

20 Once the operator has asked the questions, the caller is then connected to the subscriber's line. There is no guarantee that the subscriber will answer. The operator does not check to see if the subscriber's phone will be answered before asking the questions or attempting to connect the call.

25 This is a very labour intensive and expensive service to provide. The calling party can get irritated at being asked a lot of seemingly pointless questions each time the subscriber is called. The operator is not able to give the subscriber the option of refusing the call. The service is uneconomical to use simply to
30 screen out unwanted calls.

The object of this invention is to provide an inexpensive and easily implemented system of intercepting and screening incoming calls.

According to the invention there is provided a telephone call interception apparatus comprising first connection means for connecting the apparatus to a party calling a subscriber's telephone associated with the apparatus, interrogation means for interrogating the calling party, recording means for recording the responses given by the calling party to the interrogation, transfer means for transferring the recorded answers to the subscriber's telephone and second connection means for connecting the calling party to the subscriber's telephone, means for accepting signals from the called party to instruct the apparatus to connect the call and means for accepting a password from the operator allowing the apparatus to be bypassed in cases of emergency.

The apparatus preferably incorporates a speech synthesizer in the interrogation means.

The apparatus preferably also includes means for recording the responses given by the calling party to the interrogation. The recording means is preferably through a digital recording means. In a preferred embodiment the invention is a network system based at the local exchange capable of intercepting calls on a plurality of subscriber lines. Another preferred embodiment of the invention is a small portable unit based on the subscriber's premises.

Alternatively the apparatus uses pulse coded modulation (PCM) or linear predictive coding (LPC) to record the responses to the interrogation.

Conveniently the apparatus has means for disconnecting the calling party if the subscriber does not wish to accept the call.

Preferably the apparatus is such that the call is intercepted only if the called party answers.

Conveniently the apparatus incorporates a means for logging intercepted calls.

Advantageously the apparatus incorporates means such that the subscriber can switch the call intercept on or
5 off from the telephone to be protected, or from any telephone using an identifying password or code.

The subscriber based apparatus may incorporate a plug means for plugging into a socket on the subscriber's premises.

10 The apparatus conveniently also incorporates an alarm means to allow the subscriber to alert the telephone company to the fact that assistance is required.

The apparatus may further comprise means to allow
15 the subscriber to trigger a malicious call alarm.

Preferably the apparatus includes means for accepting a password to allow the apparatus to be overridden. This allows household members to get
20 straight through and also allows an operator to bypass the system in case of emergency.

The apparatus conveniently incorporates a telephone answering apparatus obviating the need for two pieces of equipment attached to the same telephone.

The intercept system could either be at the local
25 exchange connected to a main distribution frame (MDF) where the individual line pairs enter the local exchange, and be a chargeable service or it could take the form of a separate portable unit. The subscriber could buy or rent the unit and it could be plugged into the existing
30 telephone socket.

The present invention will now be described by way of example only and with reference to the accompanying drawings in which:

35 Figure 1a) is a block diagram of an exchange based system;

Figure 1b) is a block diagram of a subscriber based system.

Figure 2 is a block diagram of a network based system constructed in accordance with the invention.

5 Figure 3 is a block diagram of a subscriber's premises based system constructed in accordance with the invention.

10 Figure 4 is a flow diagram showing the manner of operation of a system constructed in accordance with the invention.

Referring to the drawings, Figure 1a shows an intercept apparatus 1 connected to the main distribution frame 2 (MDF) at a local exchange 3. The intercept apparatus 1 is capable of intercepting calls on a
15 plurality of lines (typically 100 or more lines per unit).

On compatible exchanges which allow customer controlled call diversion the subscriber would be able to switch the intercept apparatus on or off as required.
20 Once activated all calls would be intercepted before the called party had answered.

Referring now to Figure 1b, the intercept apparatus 1 is connected to the local exchange 3 via the subscriber's telephone socket 4, the intercept apparatus
25 being positioned between the socket and the subscriber's telephone 5.

Figure 2, shows in more detail the telephone intercept apparatus 1 situated at the local exchange 3. It has a controller 30 which controls the activities of
30 the other parts of the apparatus. When a caller rings a subscriber and the subscriber picks up the receiver to answer the call the call is then intercepted. The controller 30 causes a speech unit 31 to tell both the caller and the subscriber that the call has been
35 intercepted, and asks the caller to give a name. The

speech unit may be a speech synthesizer, or alternatively pre-recorded messages on magnetic tape or other media could be used.

Responses from the caller to questions asked by the speech unit 31, are stored in a storage unit 32, constituted by a digital storage unit eg a RAM. Alternatively, the storage unit 32 could be a simple magnetic storage means.

The controller 30 causes the responses to be transferred to the subscriber at the relevant times in the manner described below with reference to the flow chart of Figure 4.

After information has been transferred to the subscriber the controller 30 alerts an instructions receiving unit 33, to be on standby to receive instructions from the subscriber. The instruction receiving unit 33 could be a speech recognition system with a limited vocabulary or take the form of an MF tone decoder for people with speech or language difficulties.

When the subscriber indicates that the call is accepted the controller 30 signals a call connect unit 34 to connect the call if appropriate.

Where the subscriber does not wish to accept the call, the caller is referred back to the operator at the local exchange or played a suitable message.

The controller 30 and also has means (speech recogniser or an MF tone decoder) for recognising a password or other signal sent from the exchange so that the exchange operator can, upon giving the correct password or other code, override the interception mechanism and be routed directly to the subscribers telephone 5 via the call connect unit 34. Members of the subscriber's household could also have a second password allowing the system to be bypassed. The speech recognition system could be speaker dependent for added security.

The apparatus could incorporate means to allow the subscriber to instruct the apparatus not to connect any further calls from a caller. The apparatus could use a speaker dependent recognition system to recognise unwanted repeat callers.

Where the subscriber does not wish to accept the call and the caller does not hang up, thereby blocking the subscriber's line the apparatus is able to disconnect the call.

An alternative embodiment of the invention is the subscriber based unit shown in Figure 3. This is very similar to the MDF network based system, but as the subscriber based unit only intercepts calls on the subscriber line it is connected to it may be consequently much smaller and less expensive. The controller 30 controls the operation of the unit. The other parts of the unit are the same, a speech unit 31, a storage unit 32, an instruction receiving unit 33 and a call connect unit 34. In the subscriber based unit the call connect unit 34 is not able to disconnect the call if not accepted and the caller does not hang up because calls can only be disconnected by the caller or the local exchange.

Both the network based service and the subscriber's premises based service operate in substantially the same manner, which will now be described with reference to Figure 4.

The subscriber's telephone rings (at 10), and when the subscriber answers (at 11), the call is intercepted (at 12). At this point the subscriber is put on hold (at 13) and informed that the call has been intercepted (at 14). The caller is informed, either by a light on the subscriber based apparatus or a message that the call is being intercepted and logged and asked to give a name (at 15). When the caller gives a name (at 16) this is stored

(at 17) and then transferred to the subscriber (at 18). The subscriber is then given the option of accepting the call or not (at 19). If the subscriber chooses to accept the call, this is indicated to the unit by pressing a
5 dedicated button or by MF signalling, then the call is connected (at 20). Some lower cost models might not have call logging facilities but the caller will not be able to tell whether the apparatus in question can log calls or not.

10 If the subscriber chooses not accept the call, the apparatus offers the subscriber the possibility of returning a call (at 21). Again the subscriber's intentions can be indicated by dedicated "yes" or "no" buttons or by MF signalling. If the subscriber does not
15 wish to return the call then the caller is informed that the call has not been accepted (at 22) and is referred to the operator in case of emergency (at 23).

If the subscriber does choose to ring the caller back, the operator asks the caller to provide a contact
20 telephone number (at 24). The caller can then give the number (at 25) which is stored (at 26) for transmission to the subscriber (at 27) and the caller is informed that the subscriber will ring back (at 28).

Dedicated buttons with labels and lights would
25 overcome problems experienced by people with speech or language difficulties.

The subscriber based system could intercept internal calls on PABX exchanges which do not go via the local exchange, and so could not be intercepted by the operator
30 or an MDF based system.

The apparatus could incorporate means for allowing subscriber's to hear the information provided by the caller eg name and telephone number, replayed via a loudspeaker instead of through the earpiece from the
35 handset.

CLAIMS

1. Telephone call interception apparatus comprising first connection means for connecting the apparatus to a party calling a subscriber's telephone associated with
5 the apparatus, interrogation means for interrogating the calling party, recording means for recording the responses given by the calling party to the interrogation, transfer means for transferring the recorded answers to the subscriber's telephone and second
10 connection means for connecting the calling party to the subscriber's telephone, means for accepting signals from the called party to instruct the apparatus to connect the call and means for recognising a password from the exchange operator and means responsive to said password
15 causing the apparatus to be by-passed in cases of emergency. A
2. An apparatus as claimed in claim 1, wherein the password recognising means is able to recognise a second password and whereby a caller having a password can cause
20 the apparatus to be by-passed.
3. Apparatus as claimed in claim 2, comprising a multitone frequency decoder system to accept instructions from the called party.
4. Apparatus as claimed in claim 3, further comprising
25 a speech recognition system to accept instructions from the called party.
5. Apparatus as claimed in any one of the preceding claims, wherein a digital recording means constitutes the recording means for recording the responses given by the
30 calling party to the interrogation.

6. An apparatus as claimed in claim 2, where the password accepting means constitutes an MF tone decoder.
7. An apparatus as claimed in claim 2, wherein the password accepting means constitutes a speech recognition system.
8. An apparatus as claimed in claim 2, wherein the password accepting means constitutes a speaker dependent speech recognition system.
9. An apparatus as claimed in any one of the preceding claims, wherein the interrogation means incorporates a speech synthesizer.
10. An apparatus as claimed in any one of the preceding claims, wherein the apparatus only intercepts the call if the called party answers.
11. An apparatus as claimed in any one of the preceding claims, further comprising means for connecting the apparatus to a distribution frame at a local exchange, the apparatus being capable of intercepting calls on a plurality of subscriber lines.
12. An apparatus as claimed in claim 11, further comprising means for disconnecting the calling party if the subscriber does not wish to accept the call.
13. An apparatus as claimed in one of the preceding claims, wherein the apparatus can be switched on or off from any telephone by the subscriber.

14. An apparatus as claimed in any one of the preceding claims, further comprising programmable call rejection means to always reject calls from a certain party.
- 5 15. An apparatus as claimed in claim 14, wherein the programmable call rejection means further comprises a speaker recognition system.
- 10 16. An apparatus as claimed in any one of claims 1 to 10, further comprising a plug means for plugging the apparatus into a telephone socket on the subscriber's premises.
17. An apparatus as claimed in any one of the preceding claims, further comprising an alarm means to allow the subscriber to alert the telephone company to the fact that assistance is required.
- 15 18. An apparatus as claimed in any one of the preceding claims, further comprising means to allow the subscriber to trigger a malicious call alarm.
- 20 19. A telephone call interception apparatus substantially as described herein with reference to and as illustrated by the accompanying drawings.